TDRSS User Transponder

UPN 315-90-12

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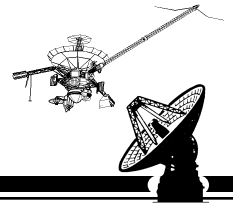
Semi-Annual Review of the FY97 SOMO/MO&DSD Technology Development Program

April 15, 1997

TDRSS User Transponder
Objective and Significance



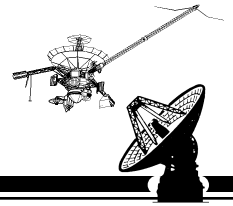
GSFC

Overall Objective

Develop a low power, low weight, low cost S-band transponder capable of bringing the global coverage, performance and cost advantages of TDRSS to the Small Satellite community.

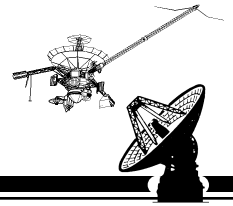
Goals	Significance
Develop a low power, low weight, low cost S-band transponder capable of operating in TDRSS or GN modes of operation for use on Small Satellites.	• **The power consumption, weight and cost of the new dual mode transponder will be comparable to the GN only transponder currently in use on low-budget Small Satellites. The use of the global TDRSS network will overcome problems and compromises which currently exist due to the limitation of GN-only support:** ⇒ **Sparse launch & early-orbit support which increases mission risk, complexity and cost in scheduling foreign ground stations and returning the data to GSFC.** ⇒ **Sparse tracking data availability limiting orbit accuracy and increasing the time for initial orbit recovery.**

TDRSS User Transponder
Objectives and Significance



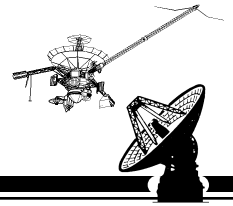
GSFC

Goals	Significance
Incorporate a K-band transmit capability in the 4th generation S-band transponder.	• The use of a K-band exciter in the transponder driving a small body-mounted phased array transmitting to the TDRS K-band system will provide sufficient gain to support 2-3 Mbps data rates which are comparable to the rates Small Satellites are currently transmitting to the ground at S-band. This will provide opportunties for lower data latency and reduced data communications costs of returning current levels of science data through TDRSS and, in dual-use scenarios, simultaneously allow very high date rates (~150 Mbps) to ground stations at K-band.
Take advantage of the flexibility, performance improvements, and mission operations cost reductions enabled by the new TDRSS demand access system.	• The TDRSS Demand Access Service (DAS) will provide unscheduled commanding on the TDRSS forward link reducing the scheduling burden and cost to the MOC. The open channel provided by the DAS return link will allow instantaneous receipt of “911 calls” or science alerts from the spacecraft. Overall, the 4th generation transponder and TDRSS DAS will bring TCP/IP telescience capabilities to Small Satellite project



FY97 Accomplishments

- **A preliminary design review was presented by Motorola on March 26 and Cincinnati Electronics on April 3.**



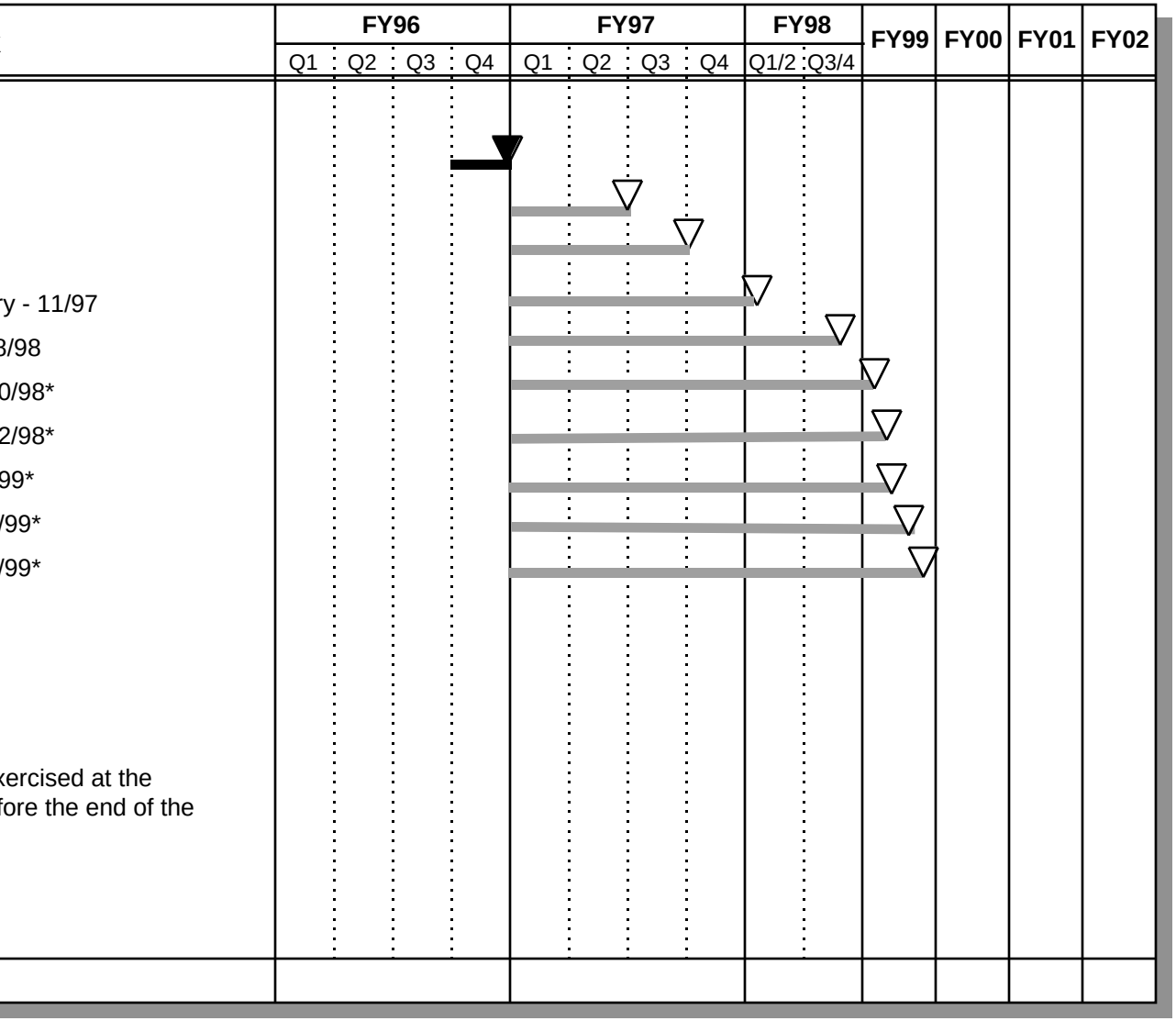
FY97 Goals

- **Completed the PDR.**
- **Progress to the CDR in OCT 97 and delivery of the engineering models in NOV 97.**

TDRSS User Transponder Schedule

GSFC

Contract with: Cincinnati Electronics



TDRSS User Transponder Schedule

GSFC

Contract with: Motorola

Task	FY96 Q1	FY96 Q2	FY96 Q3	FY96 Q4	FY97 Q1	FY97 Q2	FY97 Q3	FY97 Q4	FY98 Q1/2	FY98 Q3/4	FY99	FY00	FY01	FY02
Contract Award - 9/96				▽										
PDR - 3/97						▽								
CDR - 10/97									▽					
Engineering Model Delivery - 11/97									▽					
Protoflight Unit Delivery - 11/99											▽			
Flight Unit #1 Delivery - 1/99*											▽			
Flight Unit #2 Delivery - 3/99*											▽			
Flight Unit #3 Delivery - 5/99*											▽			
Flight Unit #4 Delivery - 7/99*											▽			
Flight Unit #5 Delivery - 9/99*											▽			

* Assumed options are exercised at the same time 120 days before the end of the basic contract